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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,634	11/14/2003	David Randall Blea	TUC920030093US1	2435
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Kunzler & McKenzie 8 EAST BROADWAY SUITE 600 SALT LAKE CITY, UT 84111			EXAMINER ELAND, SHAWN	
			ART UNIT 2188	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/713,634	Applicant(s) BLEA ET AL.	
	Examiner SHAWN ELAND	Art Unit 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32,38,39 and 41-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32,38,39 and 41-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/10/09 has been entered.

Status of Claims

Claims 1 – 32, 38 – 39, & 41 – 45 are pending in the Application.

Claims 1, 6, 9, 17, 25, & 38 have been amended.

Claims 33 – 37, & 40 are cancelled.

Claims 1 – 32, 38 – 39, & 41 – 45 are rejected.

Response to Amendments

In view of the amendments made by the Applicant, the 35 U.S.C. 112 2nd paragraph rejection for claim 6 has been withdrawn.

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Applicant's remaining amendments and arguments filed on 02/10/09 in response to Office action filed 11/08/08 have been fully considered, but they are not persuasive.

Therefore, the rejections made in the previous Office action are maintained and restated below, with changes needed to address the amendments.

Information Disclosure Statement

The information disclosure statement filed 12/04/07 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. More specifically, Japanese publication JP 2003048707 does not have an English translation. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4 – 10, 12 – 18, 20 – 26, 28 – 32, 38 – 39 and 45 are rejected under 35

U.S.C. 102(b) as being anticipated by **Yanaka** (US Patent 6,467,034 B1).

In regard to claim 1, Yanaka teaches:

an identification module configured to identify one or more available copy functions in response to a data copy request to copy data (the write activity detector monitors the write requests and identifies if the present mode (i.e. synchronous, semi-synchronous or adaptive – the three predefined copy policies) is appropriate for the data transfer – col. 7, lines 20-32) **to a secondary storage device** (the system copies between elements 111 and 211 in figure 1), **each identified copy function compatible with the secondary storage device** (this is a disk mirroring method; Abstract) **and available to an application to copy data of the data copy request to the secondary storage device** (the ability to copy the functions show they are available to an application as its the application that requests these functions), **the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data** (the system copies between elements 111 and 211 in figure 1);

a comparison module configured to compare one or more copy function attributes of each available copy function to corresponding copy policy attributes of a predefined copy policy (the write activity detector compares the present mode with the predefined modes to determine if the amount of activity required at that time can be efficiently serviced – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11), **wherein the copy policy comprises a set of copy policy attributes that correspond to the copy function attributes of each copy function, wherein the copy function**

attributes comprise predefined values that indicate functionality characteristics of the corresponding copy function (the attributes of the performance metrics of Yanaka are used to determine the predefined mode);

a selection module configured to automatically select a copy function that satisfies the predefined copy policy based on the comparison of the copy function attributes to the corresponding attribute objectives of the copy policy (the write activity detector issues a command to change the remote copy mode to another predefined mode that is most appropriate for the transfer – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11); **and**

a relationship module configured to establish a copy relationship between the selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the data to a secondary storage device (once the write activity detector issues the command to change the copy mode, the new mode is set for the transfer – again, col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11), **wherein the identification module, the comparison module, the selection module, and the relationship module comprise at least one of hardware and executable code** (figure 1), **the executable code executable on a processor and stored on one or more computer readable media.**

In regard to claim 9, Yanaka teaches:

a policy generation module configured to establish a copy policy compatible with an application (the host issues commands which are subsequently

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analyzed by the write activity detector to determine if the generated copy policy is best suited for the application – col. 7, lines 20-42) , **the copy policy comprising one or more copy policy attributes** (the write activity detector bases its decision to change the mode based on attribute data from the host (i.e. number of commands, quantify of information, response time, access range, etc.) – col. 9, lines 8-36); **and**

a copy request module (Fig. 1, the activity detector (element 125) works in conjunction with the host (element 100) and the remaining elements of the controller (element 101) to perform the copy request) **configured to:**

recognize a data copy request that includes the copy policy (the write activity detector recognizes the copy request and the mode of transfer (i.e. synchronous, semi-synchronous or adaptive) – col. 7, lines 20-50) ;

identify one or more available copy functions (the write activity detector monitors the write requests and identifies if the present mode (i.e. synchronous, semi-synchronous or adaptive – the three predefined copy policies) is appropriate for the data transfer – col. 7, lines 20-32), **each copy function compatible with one or more secondary storage devices** (this is a disk mirroring method; Abstract) **and available to the application to copy data to a secondary storage device of the one or more secondary storage devices** (the ability to copy the functions show they are available to an application as its the application that requests these functions), **the one or more secondary storage devices available to the application for storing the data** (the system copies between elements 111 and 211 in figure 1);

compare copy function attributes of each copy function for a storage device to copy policy attributes of the copy policy (the write activity detector compares the present mode with the predefined modes to determine if the amount of activity required at that time can be efficiently serviced – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11), **wherein the copy policy comprises a set of copy policy attributes that correspond to the copy function attributes of each copy function, wherein the copy function attributes comprise predefined values that indicate functionality characteristics of the corresponding copy function** (the attributes of the performance metrics of Yanaka are used to determine the predefined mode);

automatically select a copy function that satisfies the copy policy based on the comparison of the copy function attributes to the corresponding attribute objectives of the copy policy (the write activity detector issues a command to change the remote copy mode to another predefined mode that is most appropriate for the transfer – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11); **and**

establish a copy relationship between the selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the data to a secondary storage device (once the write activity detector issues the command to change the copy mode, the new mode is set for the transfer – again, col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11), **wherein the identification module, the comparison module, the selection module, and the relationship module comprise at least one of hardware and executable code**

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(figure 1), **the executable code executable on a processor and stored on one or more computer readable media.**

In regard to claim 17, Yanaka teaches:

a file server (files are copied between hosts 100 and 200 in figure 1)
comprising

an application module configured to send a data copy request from an application (Fig. 1, host A (element 100) - col. 5, lines 61-66);

an identification module configured to identify one or more available copy functions in response to a data copy request to copy data (the write activity detector monitors the write requests and identifies if the present mode (i.e. synchronous, semi-synchronous or adaptive – the three predefined copy policies) is appropriate for the data transfer – col. 7, lines 20-32) **to a secondary storage device** (the system copies between elements 111 and 211 in figure 1), **each copy function compatible with the secondary storage device** (this is a disk mirroring method; Abstract) **and available to an application to copy data of the data copy request to the secondary storage device** (the ability to copy the functions show they are available to an application as its the application that requests these functions), **the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data** (the system copies between elements 111 and 211 in figure 1);

a comparison module configured to compare one or more copy function attributes of each available copy function to corresponding copy policy attributes of a predefined copy policy (the write activity detector compares the present mode with the predefined modes to determine if the amount of activity required at that time can be efficiently serviced – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11), **wherein the copy policy comprises a set of copy policy attributes that correspond to the copy function attributes of each copy function, wherein the copy function attributes comprise predefined values that indicate functionality characteristics of the corresponding copy function** (the attributes of the performance metrics of Yanaka are used to determine the predefined mode); **and**

a selection module configured to automatically select a copy function that satisfies the predefined copy policy based on the comparison of the copy function attributes to the corresponding attribute objectives of the copy policy (the write activity detector issues a command to change the remote copy mode to another predefined mode that is most appropriate for the transfer – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11); **and**

a relationship module configured to establish a copy relationship between the selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the data to a secondary storage device (once the write activity detector issues the command to change the copy mode, the new mode is set for the transfer – again, col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11).

In regard to claims 25 & 38, these claims recite a method and computer readable medium respectively which are similar in scope to claim 1, therefore these claims are rejected based on the same rationale as claim 1, as per the rejection *supra*.

As for claim 2, Yanaka teaches **a policy generation module configured to read a set of required attributes from the application and to establish the predefined copy policy based on the set of required attributes from the application** (the write activity detector bases its decision to change the mode based on attribute data from the host (i.e. number of commands, quantify of information, response time, access range, etc.) – col. 9, lines 8-36).

As for claim 4, Yanaka teaches **the identification module as being further configured to determine a set of copy functions compatible with the application, determine a set of copy functions compatible with a source storage device and a destination storage device, where the data of the data request is stored, and the secondary storage device, and to determine the available copy functions that are common to both the set of copy functions compatible with the application and the set of copy functions that are compatible with the source storage device and the secondary storage device** (all three modes are compatible with the application, source storage device, and destination storage device. The write activity detector determines

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the best mode for most efficient mirroring based on system requirements at the time – col. 7, lines 25-36 and col. 5, line 61 through col. 6, line 11).

As for claim 5, Yanaka teaches **the comparison module is further configured to compare a one or more copy function attributes of a copy function to corresponding predefined copy policy attributes, of the predefined copy policy, for each of a group of available copy functions and the selection module is further configured to select a copy function with a largest number of copy function attributes that satisfy the predefined copy policy attributes** (the write activity detector will select a copy function that is most efficient based on the attributes (i.e. number of commands, quantify of information, response time, access range, etc.) of the application – col. 9, lines 8-36).

As for claim 6, Yanaka teaches **the comparison module is further configured to calculate a difference between one or more predefined copy policy attributes, each configured as a numerical value, and corresponding predefined copy policy attributes, each configured as a numerical value, for each of a group of available copy functions and the selection module is further configured to select a copy function where differences between the numerical values of the copy function attributes and the numerical values of the predefined copy policy attributes is the smallest** (the mode is determined based on the outcome of a weighted sum to establish a mode most similar to the one required for maximizing mirroring efficiency – col. 9, lines 10-36).

As for claim 7, Yanaka teaches **the comparison module is further configured to compare one or more copy function attributes to corresponding predefined copy function attributes for each of the available copy functions to determine a score for each attribute of each copy function, to multiply each score by a priority factor to determine an adjusted score, to sum the adjusted scores for each copy function, and the selection module is further configured to select a copy function with a highest sum of adjusted scores** (the mode is established by multiplying a correlation coefficient by the number of commands fitting in an access range, effectively prioritizing which mode is most efficient for the mirroring; if the upper limit is exceeded, the mode is changed appropriately – col. 9, lines 10-36).

As for claim 8, Yanaka teaches **the comparison module is further configured to calculate a difference one or more copy function attributes, each configured as a numerical value, and corresponding predefined copy policy attributes for each of the available copy functions, to multiply each difference by a priority factor to obtain an adjusted difference, to sum the adjusted differences for each copy function, and the selection module is further configured to select a copy function with a lowest sum of adjusted differences** (the mode is established by a weighted sum of values by multiplying a correlation coefficient by the number of commands fitting in an access range, effectively prioritizing which mode is most efficient for the mirroring; if the upper limit is exceeded, the mode is changed appropriately – col. 9, lines 10-36).

Claims 10, 12-16, 18, 20-24, 26 and 28-32 are similar in scope to claims 2 and 4-8; therefore they are rejected based on the same rationale as claims 2 and 4-8.

Claim 39 is similar in scope to claim 4; therefore it is rejected based on the same rationale as claim 4.

As for claim 45, Yanaka teaches **wherein a predefined copy policy attribute within the predefined copy policy comprises an application impact, wherein an application impact comprises a performance impact caused by a copy function to the application, the performance impact measured in a unit of time** (col. 9, lines 10 – 36; the write detector checks the responded per unit time).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 11, 19 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanaka** (US Patent 6,467,034 B1) as applied to claims 1, 9, 17 and 25 respectively above, and in further view of **Yamagami** (US PG Publication 2002/0143999 A1).

As for claim 3, though Yanaka teaches a **policy generation module configured to determine the predefined copy policy based on a set of required attributes from an application** (as per the rejection of claim 2 above), he fails to specifically teach **allowing a user to determine the policy**.

Yamagami however teaches path selection method for storage based remote copy in which a user is capable of selecting a copy policy based on system attributes (paragraph 0006, all lines).

It would have been obvious to one of ordinary skill in the art at the time of the invention for Yanaka to further include Yamagami's path selection method into his own data mirroring method. By doing so, Yanaka could minimize the cost of data transfer in his system via user-selectable multiple network connections as taught by Yanaka in paragraphs 0004 through 0005, all lines.

Claims 11, 19 and 27 are similar in scope to claim 3; therefore they are rejected based on the same rationale as claim 3.

Claims 41 – 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanaka** (US Patent 6,467,034 B1) as applied to claim 1 above, and further in view of **IBM** ("Leveraging new storage technology for a competitive edge").

As for claim 41, Yanaka teaches knowing the amount of data received (col. 9, lines 8 - 36) but does not teach **wherein a predefined copy policy attribute within**

the predefined copy policy comprises a recovery point objective (“RPO”), wherein an RPO comprises an amount of data lost over a period of time.

As for claim 42, Yanaka does not teach **wherein a predefined copy policy attribute within the predefined copy policy comprises a recovery time objective (“RTO”), wherein an RTO comprises an amount of time to recover data to a usable condition.**

As for claim 43, Yanaka does not teach **wherein a predefined copy policy attribute within the predefined copy policy comprises a distance to a secondary site where the secondary storage device is stored.**

IBM teaches that in designing a storage system, a user needs to understand how critical the data is to the enterprise and its impact on the business (page 10, 1st bullet point). IBM further teaches consideration as to how long data may not be available if down (page 10, 1st bullet point). IBM also teaches that a lifecycle policy should also be considered as to where data is stored (page 10, 4th bullet point). This would affect how often data is stored and how long it'd take to restore and where it's located.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Yanaka's predefined copy policy attribute by implementing attributes for: how much data can be lost between backups, how much time is taken to recover the data; and an indication as to where or how far away the backup data is stored. Taking all of these issues into consideration allows for the users to successfully meet their storage needs by creating an infrastructure that not only

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meets their current needs, but is flexible enough to meet future needs (page 12, "Conclusion").

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Yanaka*** (US Patent 6,467,034 B1) as applied to claim 1 above, and further in view of ***Applicant's admitted prior art***.

As for claim 44, Yanaka does not overtly teach **wherein a predefined copy policy attribute within the predefined copy policy comprises a consistency, wherein a consistency comprises a determination of dependency on other stored data**, but does teach that systems typically don't allow another request until the current request completes (col. 2, lines 31 - 48). In the Applicant's specification, it clearly states that data cannot be recovered in a typical business environment "without the correctness of the data upon which it depends" (page 21, lines 5 – 7), thus implying that successful data recovery would include understanding the dependencies within that data. It would make no sense for a business to back up or copy data that it cannot recover. In fact, it would defeat the purpose of copying. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Yanaka's predefined copy policy attribute within the predefined copy policy by implementing a typical consistency attribute so that users can recover their data.

Response to Arguments

Applicant's arguments filed 02/10/09 have been fully considered but they are not persuasive.

Applicant argues *that monitoring activity is not the same as comparing attributes of copy policy with attributes of a copy function that include predefined values. Also, Yanaka does not compare attributes with attributes, but instead compares performance metrics.* There is nothing in the Applicant's specification that limits attributes in such a fashion as to exclude performance metrics from the scope of the claim language. In this case, performance metrics can be considered attributes of the copy function. The Examiner still maintains his position from the previous Office action filed 11/08/08.

Applicant argues *Yanaka does not teach selecting a copy function from copy functions compatible with a storage device and also available to an application.* Being able to copy to the secondary storage device would mean the copy function is compatible with the storage device. Otherwise the copy could not take place.

Examiner's Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn Eland whose telephone number is (571) 270-1029. The examiner can normally be reached on MO - TH, & every other FR.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hyung S. Sough/
Supervisory Patent Examiner, Art Unit 2188
04/27/09

/Shawn Eland/
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4/30/2009